

group, a 1,3-dimethyl-2-ethylindenyl group, a 4,5,6,7-tetrahydroindenyl group, a 1-methyl-4,5,6,7-tetrahydroindenyl group, a 1,2-dimethyl-4,5,6,7-tetrahydroindenyl group, a 1,3-dimethyl-4,5,6,7-tetrahydroindenyl group, a 1,2,3-trimethyl-4,5,6,7-tetrahydroindenyl group, a 2-methyl-4,5,6,7-tetrahydroindenyl group, a 1-ethyl-4,5,6,7-tetrahydroindenyl group, a 1-ethyl-2-methyl-4,5,6,7-tetrahydroindenyl group, a 1-ethyl-3-methyl-4,5,6,7-tetrahydroindenyl group, a 1-ethyl-2,3-dimethyl-4,5,6,7-tetrahydroindenyl group, a 1,2-diethyl-4,5,6,7-tetrahydroindenyl group, a 1,2-diethyl-3-methyl-4,5,6,7-tetrahydroindenyl group, a 1,3-diethyl-4,5,6,7-tetrahydroindenyl group, a 1,3-diethyl-2-methyl-4,5,6,7-tetrahydroindenyl group, a 1,2,3-triethyl-4,5,6,7-tetrahydroindenyl group, a 2-ethyl-4,5,6,7-tetrahydroindenyl group, a 1-methyl-2-ethyl-4,5,6,7-tetrahydroindenyl group, a 1,3-dimethyl-2-ethyl-4,5,6,7-tetrahydroindenyl group, a fluorenyl group, a 9-methylfluorenyl group, a 9-ethylfluorenyl group, a 1,2,3,4-tetrahydrofluorenyl group, a 9-methyl-1,2,3,4-tetrahydrofluorenyl group, a 9-ethyl-1,2,3,4-tetrahydrofluorenyl group, a 1,2,3,4,5,6,7,8-octahydrofluorenyl group, a 9-methyl-1,2,3,4,5,6,7,8-octahydrofluorenyl group, a 9-ethyl-1,2,3,4,5,6,7,8-octahydrofluorenyl group, etc.

Specific examples of the transition metal compounds of formula (4) are mentioned below. In these, titanium may be replaced with zirconium, and such zirconium compounds are also referred to herein to the same effect.

They are cyclopentadienyltitanium trichloride,
cyclopentadienyltitaniumtrimethyl, cyclopentadienyltitanium
trimethoxide, cyclopentadienyltitaniumtribenzyl,
methylcyclopentadienyltitanium trichloride,
methylcyclopentadienyltitaniumtrimethyl,
methylcyclopentadienyltitanium trimethoxide,
methylcyclopentadienyltitaniumtribenzyl,
dimethylcyclopentadienyltitanium trichloride,
dimethylcyclopentadienyltitaniumtrimethyl,
dimethylcyclopentadienyltitanium trimethoxide,
dimethylcyclopentadienyltitaniumtribenzyl,
trimethylcyclopentadienyltitanium trichloride,
trimethylcyclopentadienyltitaniumtrimethyl,
trimethylcyclopentadienyltitanium trimethoxide,
trimethylcyclopentadienyltitaniumtribenzyl,
tetramethylcyclopentadienyltitanium trichloride,
tetramethylcyclopentadienyltitaniumtrimethyl,
tetramethylcyclopentadienyltitanium trimethoxide,
tetramethylcyclopentadienyltitaniumtribenzyl,
pentamethylcyclopentadienyltitanium trichloride,
pentamethylcyclopentadienyltitaniumtrimethyl,

pentamethylcyclopentadienyltitanium trimethoxide,
 pentamethylcyclopentadienyltitaniumtribenzyl,
 indenyltitanium trichloride, indenyltitaniumtrimethyl,
 indenyltitanium trimethoxide, indenyltitaniumtribenzyl, 1-
 methylindenyltitanium trichloride, 1-
 methylindenyltitaniumtrimethyl, 1-methylindenyltitanium
 trimethoxide, 1-methylindenyltitaniumtribenzyl, 2-
 methylindenyltitanium trichloride, 2-
 methylindenyltitaniumtrimethyl, 2-methylindenyltitanium
 trimethoxide, 1-methylindenyltitaniumtribenzyl, 1,2-
 dimethylindenyltitanium trichloride, 1,2-
 dimethylindenyltitaniumtrimethyl, 1,2-
 dimethylindenyltitanium trimethoxide, 1,2-
 dimethylindenyltitaniumtribenzyl, 1,3-
 dimethylindenyltitanium trichloride, 1,3-
 dimethylindenyltitaniumtrimethyl, 1,3-
 dimethylindenyltitanium trimethoxide, 1,3-
 dimethylindenyltitaniumtribenzyl, 1,2,3-
 trimethylindenyltitanium trichloride, 1,2,3-
 trimethylindenyltitaniumtrimethyl, 1,2,3-
 trimethylindenyltitanium trimethoxide, 1,2,3-
 trimethylindenyltitaniumtribenzyl, 1,2,3,4,5,6,7-
 heptamethylindenyltitanium trichloride, 1,2,3,4,5,6,7-
 heptamethylindenyltitaniumtrimethyl, 1,2,3,4,5,6,7-
 heptamethylindenyltitanium trimethoxide, 1,2,3,4,5,6,7-